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ABSTRACT

Current research on the adult learner and on instruction through media has grave flaws, and reviews of research in five areas are needed to assist instructional developers and adopters in making wise decisions. These include a critical analysis of existing telecourse packages, as well as reviews of research on the motivation of various subgroups of adults and the recruitment and retention strategies which are effective for them; instructional strategies effective for different subgroups of adult learners; the logistics and costs of alternative delivery technologies and the audiences they are likely to reach; and technical assistance and training needed by new adopters. Forty-three references are listed. (Author/LLS)

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ISSUES IN TELEVISION-CENTERED INSTRUCTION

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In this country we have had decades of high hopes for the use of technology to solve educational problems, but so far, the printed word or picture is the most widely used technique for mediating instruction in higher education. Ten years ago, when there was great optimism about applications of electronically mediated instruction, the Carnegie Commission on Higher Education (1972, p. 1) forecast that "by the year 2000 it now appears that a significant proportion of instruction in higher education on campus may be carried on through informational technology. But by 1975, a further study sponsored by the Carnegie Commission (Rockart and Morton, 1975) suggested instead:

> .....the real impact of the new technology will for the most part be adding to, rather than replacing, current learning mechanisms. Some current mechanisms will be displaced, but the new technology will allow two major improvements. First, it will provide increased enrichment...Second, it will provide increased access by university faculty to students formerly outside the geographic limits of the regular educational system (p. 276).

It is this latter possibility that is now generating such enthusiasm on the part of certain higher educators and educational technologists. Demographics indicate that colleges and universities of the 1980's will have to deal with an increasingly diverse range of students--diverse in age, educational purpose, background and preparation, socioeconomic status, and ethnicity. If these institutions are to meet the nation's educational needs in the

future, so the argument goes, they cannot limit their concern to students who are between the ages of 18 and 25, white, middle-class, and academically skilled (Chickering, 1981). Major pressures for change come from nontraditional groups of students new to higher education: those over 25 (who already outnumber students under 25), women with families, minority students, and students from nonacademic backgrounds. Clearly, to the enthusiasts for technology, the problem can best be solved by telecommunications technologies, which can deliver instruction to students at times and places convenient to them.

A number of events nationally have heightened this sense that, at last, it's all about to happen. Many telecourse consortia are now in the business of producing, marketing, and offering telecourses (Munshi, 1980; Richardson, 1980b; Yarrington, 1979). A study done in 1979 by the National Center for Educational Statistics and the Corporation for Public Broadcasting indicates that some 71% of the nation's higher education institutions made some use of television for instructional and other purposes during 1978-79 (Dirr, et al, 1981).

The Public Broadcasting Service begins its new Adult Learning Programming Service this September, offering six telecourses through public television stations to students unable to attend college on campus. New technologies are proliferating, and the 1978 Public Telecommunications Finances Act redefined telecommunication to include many modes of delivery: transmission via broadcast television and radio and other-than-broadcast distribution including coaxial cable, optical fiber, broadcast translators, cassettes,

discs, microwave, or laser transmission through the atmosphere. The Carnegie Corporation has funded the American Association of Higher Education to establish a Center for Learning and Telecommunications (Center for Learning and Telecommunications, 1981). And to clinch it and convince everyone that the Promised Land is finally here, former ambassador Walter H. Annenberg has given $150 million dollars to the Corporation for Public Broadcasting, to create new telecourses and to demonstrate the use of communications systems in solving higher education problems (Corporation for Public Broadcasting, 1981).

Clearly, this proliferation of technologies and accompanying surge of entrepreneurial activities raises questions of great importance to higher and adult educators. What criteria should be used for selecting and supporting programs and projects? What is known about adult motivation and recruitment practices effective with different subgroups? What is known about instructional strategies effective in bringing about learning achievement for adults who participate in mediated instructional systems? What is known about the logistics, costs, and audiences for various technological delivery systems? What evaluative case studies exist which analyze means-ends relationships and unintended consequences?

Decision-makers who turn to the research on mediated instruction or on adult learning will find little to guide their decisions. Wilkinson's critique of sixty years of research on media in instruction (1980) summarizes a number of problems with the research: imprecise definitions of terms, poor research questions, faulty experimental designs, research which trades off internal validity for external validity. Cross's attempt to make sense of research on adults as learners (1981) indicates a similar paucity of useful findings,

probably because age per se is not a critical variable in predicting learning (Knox, 1980). Much of the research she summarizes was not done on learning outcomes at all, but on reasons adults give for participation or on claims they make about their "self-directed learning projects."

What is needed are some reviews of research which would critique and synthesize findings from instructional psychology, instructional technology, adult higher education, mass communications, social psychology, and related fields. These reviews should be addressed to decisionmakers and should assist in developing or selecting educationally sound telecourses for adults. The particular reviews suggested here center on reaching and teaching the adult learner, as opposed to dealing with organizational, institutional, or policymaking areas.

1. A critical analysis is needed of existing telecourse packages and their theories of content, teaching-learning processes, and evaluation.
2. A review of research should be done on the motivation of various subgroups of adults and the recruitment and retention strategies which are effective for them.
3. A review of research should be done on instructional strategies effective for adult learners.
4. A review of research is needed on the logistics and costs of alternative delivery technologies and support systems and the audiences they are likely to reach.
5. A review of research needs to be done on the technical assistance and training needs of the new adopters.

I . A CRITICAL ANALYSIS IS NEEDED OF EXISTING TELECOURSE PACKAGES.

As the certainty grows that the modern American college will be populated by a very different kind of student, the adult learner, much thought is being given to implications for the mission of higher education. Chickering (1981) has suggested that the idea of human development can supply a unifying purpose for the modern American college.

> By understanding how students from 18 to 80 meet life cycle challenges and grow in terms of intellectual competence, ego development, moral and ethical development, humanitarian concern, interpersonal competence, capacity for intimacy, and professional development, educators can examine the potential contributions of various disciplines, areas of professional preparation, and educational practice.
> (Chickering, 1981, p. 7)

In the development of telecourse materials for adults, it is especially important that a clear definition of the criteria for excellence be developed. New technologies are developing rapidly, new monies are available for course development, and new pressures are being felt by technologists and educators to produce and market their wares. The various institutions involved in telecourse development are beset by a variety of political pressures and could easily be tempted by quick profit, ; pulled a dozen different ways and lose sight of the key question: the purpose of education.

Conceptually, the kinds of questions which must be asked about existing or developing telecourses include the following: What is their view of the learner? Of the teacher? Of the interaction between the two? Of the structure of the knowledge, skills, and attitudes it is hoped the learner will develop? Of the relationship between the goals of the learning situation and broader societal needs? Course producers need to make explicit and to subject to public scrutiny the theories of content, teaching-utilization, and

student effect (Butman and Fletcher, 1973) upon which instructional choices are based. A constant dialogue between theory and practice is needed as the work of course development and acquisition proceeds.

Keppel and Chickering (1981) question whether educational technologies and varied forms of mediated instruction can contribute significantly to life cycle developmental tasks and to major dimensions of adult development. They concede that such vehicles may do a reasonably good job in imparting knowledge, communicating concepts, and helping students learn the language, methods of inquiry, and modes of thought of various disciplines or vocations. They recognize that such media may, when properly developed, achieve a wide range of training outcomes, especially if they can respond effectively to individual differences. But they view skeptically the suggestion that such vehicles could aid students in more general areas of human development.

A critical analysis of existing telecourse packages could identify those examples which seem aimed at accomplishing the broader adult development goals mentioned above, and could clarify and make explicit the different curricular conceptions represented in the various packages (Vallance, 1981). The packages could also be evaluated according to the degree to which they assist learners to identify their own strengths and weaknesses as independent learners, and provide developmental assistance, as suggested by Richardson (1981). The outcome would be the development of evaluative criteria to guide the creation of new course packages, criteria which consider the new goals for higher education and the importance of adult development as well as learning achievement outcomes.

II. A REVIEW OF RESEARCH SHOULD BE DONE ON THE MOTIVATIONS OF VARIOUS SUBGROUPS OF ADULTS AND THE RECRUITMENT AND RETENTION STRATEGIES WHICH ARE EFFECTIVE FOR THEM.

One of the hopes of funders of distance learning opportunities is that access will be provided to higher education for groups of students previously unable to take advantage of educational opportunities. Data on who currently participates in the distance learning opportunities available is scattered. Bryan and Forman (1977) indicate that the population of University of Mid-America distance learners is 75% women, average age 37, median income $11,000, half of whom had not participated in formal education during the previous five years. Their goals were personal satisfaction and career development, and two-thirds wanted degrees. McIntosh and Woodley (1975) indicate that Britain's Open University appeals mainly to the upwardly mobile students, of working class backgrounds, who have professional and technical jobs. The labor class is unrepresented (true in America too), although the original purpose of the British Open University was to provide a "second chance" for the educationally deprived.

A review of research is needed to identify strategies effective in recruiting and retaining different sub-groups of adult learners, so that decisionmakers have more than demographic data to go on.

Such a review should have a number of characteristics. First, it should provide operational definitions of the strategy in question. Much that has been written about recruitment is vague and exhortatory; recruitment strategies such as "media advertisements," "alumni networks," or "college fair" are mentioned. But from much that it written, it is not clear who the strategy is intended to reach, why people believe it would be successful, and specifically what the psychological functions of the recruitment strategy are. The same is true for retention strategies. Explicit operational definitions of recruitment and retentions strategies need to be gathered.

Second, such a review should include the literature on effective recruitment and retention strategies for campus-based learners as well as distance learners, and for other kinds of activities besides learning activities. The basic question in recruitment and retention is this: what causes people to decide to participate in something and to stick with it once they're involved? In an Education Testing Service summary of several studies on college student attrition and retention., the reasons students give for leaving include academic matters; financial difficulties; motivational problems; personal considerations; full-time jobs; the expressed need for new, practical, nonacademic experiences; and the lack of initial plans to obtain a degree (Ramist, 1981). Some of the reasons don't fit the adult distance learner; others do.

Specifically, two factors crucial to retention were faculty-student interaction and effective counseling. Much has been written about campus-based recruitment and retention, and this literature should be culled for useful advice for planners of distance learning.

Third, such a review should provide a functional analysis of the recruitment/retention strategies presented. For example, the psychological literature tells us that the outcome of persistence is linked to the strategy of reinforcement. Whether on- or off-campus students are the target audience, activities which reinforce them for their efforts are needed if they are to persist as students.

Fourth, such a review should identify the critical characteristics of adults which predict participation and persistence in a distance learning program. Cross (1981) has developed a Chain of Response Model which summarizes key factors others have suggested are significant. She suggests that when a learner needs to learn something, and realizes it, two initial factors will determine action: self-evaluation and attitudes about education. If both these are positive, influencing factors might be life transitions, importance of related new goals, and expectation that participation in education would assist in meeting those new goals. If these are all positive, the learner would then seek information about education, and would assess the opportunities and barriers in various educational situations. If these factors are favorable, the learner is ready to make the decision to participate. If all goes well, the learner's self-evaluation and attitudes toward education become more positive, and the likelihood of further participation increases. She points out that institutions focus their effort on providing information and removing institutional barriers, when the real blocks may be earlier in student self-concept or attitude

Also, the individual differences of adults should be taken into account in such a review. What attracts and retains a successful and self-confident learner might be very different from what would attract and keep an anxious and inexperienced learner.

Fifth, such a review should be theoretically oriented, showing the relationship of recruitment/retention strategies to psychological effects on the learner. Miller's force field analysis (1967), Rubenson's expectancy-valency paradigm (1977), Boshier's congruence model (1971), and Tough's anticipated benefits model (1979), are all attempts to develop explanatory principles for adult participation. A theory of the achievement motivation and cognitive development of adults of various aptitudes needs to be developed and related to the effective environmental interventions (recruitment/retention strategies) which might be used.

Sixth, such a review should be eclectic and pragmatic, making appropriate use of strategies grounded in marketing research, social psychology, and communications theory. Mass communications researchers and practitioners (such as advertisers) have a good deal of knowledge applicable to recruiting adult learners to telecourses, and that knowledge should be tapped.

Lavish expenditures to develop new learning opportunities are wasted if adults don't take advantage of them, and "equal opportunity" arguments are empty if only the affluent and educated are customers for distance learning. A review of research on recruitment and retention strategies for different subgroups is needed.

III. A REVIEW OF RESEARCH IS NEEDED ON INSTRUCTIONAL STRATEGIES WHICH PREDICT LEARNING ACHIEVEMENT FOR DIFFERENT SUB-GROUPS OF ADULT LEARNERS.

One of the problems with the newer telecommunications technologies is that their glamor often prevents people from thinking clearly about them. As Clark points out (1980b), one result is that developers too rarely distinguish between technology as a mode of transmission of messages, instructional or otherwise, and technology as a set of specific techniques employed in the instructional act. "Technologies of transmission" refers to those technologies which transmit messages. They are simply delivery devices which transmit instructional programs, in the same way that a postman or a carrier pigeon delivers a letter. "Technologies of instruction," on the other hand, are the set of research-derived principles for the design of instructional strategies which make up the teaching-learning process: strategies such as cuing the learner so that he/she attends to the appropriate instructional task, designing the instructional message so that it activates existing information-processing skills, reinforcing and providing feedback, or building appropriate amounts of novelty or humor into instruction. Wilbur Schramm (1977) has recently noted that learning and achievement are more affected by the techniques we employ in the instructional act than by the medium which we choose to deliver instruction. The most important issue, seldom addressed by instructional technologists, is which of the many instructional methods which are available should be transmitted by an instructional medium. This decision

rests less on the technology of transmission than on our current knowledge of instructional research and development.

Such a review should have a number of characteristics. First, it should provide operational definitions of the strategy in question. A problem with much of the research which compares one instructional treatment to another is that the treatments are not clearly specified; they are combinations of techniques which go under vague, generic labels such as "programmed instruction" or "personalized system of instruction." Thus the findings are difficult to interpret. It has been commented that educational psychologists are able to measure individuals with micrometers but that they tend to measure treatments with divining rods, and that situation still prevails today. A number of individuals are working on developing better specification of instructional treatments (Leinhardt, 1980; Clark, 1980b) and their work can be consulted for further guidelines in this area.

Second, such a review should include the literature on effective instructional strategies for all age groups, not merely adults. Many research-derived principles about human learning and instruction have been discovered which offer guidance for the design of instructional strategies for all ages: strategies such as cuing the learner so that he/she attends to the appropriate instructional task, designing the instructional message so that it activates existing information-processing skills, reinforcing appropriate behaviors, or building appropriate amounts of novelty or humor into instruction (Menges, 1981). These findings need to be applied to instructional design for adults rather than putting adult instruction in a ghetto uninfluenced by discoveries about learning.

Third, such a review should provide a functional analysis of the instructional strategies presented. Salomon (1979) describes three models for thinking about the function of all methods: remedial (in which the function is to insure that the learner acquires the skills s/he needs in order to solve an instructional problem), compensatory (in which the function is to circumvent a learner's weakness by supplying him or her with the temporary aids needed in order to solve an instructional problem) and preferential (in which the function is to build upon the learner's special capabilities). Each of these models is supported by a body of instructional research which suggests helpful design principles to practitioners.

Fourth, such a review should identify the critical aptitudes in adults which predict learning from a given instructional strategy. Adults with high general ability, well-developed cognitive strategies, prior learning in the subject area, constructive (as opposed to defensive) motivation, and a strong sense of self-efficacy are likely to to do well in an instructional situation which puts much of the information-processing load on them, in other words, one which is relatively unstructured; adults who lack these characteristics are likely to need their instruction to be more directive, structured, broken into small steps with immediate feedback at each step, and so on. Further writing on the relationship of adult aptitudes to appropriate instructional techniques can be found in Cronbach and Snow, 1977; Clark, 1980b; Allen, 1975; Goldstein, 1973; Salomon, 1979; Richardson, 1981).

Fifth, such a review should be theoretically oriented, showing the relationship of instructional strategies to psychological effects on the learner. Salomon (1979) points out that we need to move research on media in education from an atheoretical, unsystematic, "isolationist" exploration to a more systematic, theoretically guided inquiry. one which would relate the learner's information-processing capacity to the medium's particular way of structuring and conveying contents through its symbol systems.

> If media differ along specific dimensions (such as their technologies of transmission, contents, or symbol systems), then there are a number of possible ways in which media can interact with human behavior and learning. Not only do the sources of variance differ, but they affect different domains of outcome. The technology of a medium affects the modes of interaction with users (compare computer-based instruction with a television show of the same content), and the transmitted content affects the knowledge acquired. The social context in which a message is received affects emotional states, and the didactic mode of the message affects the ease of processing its content. It follows,then, that different aspects of media interact with different aspects of behavior, thus undermining a conception of media as invariant entities.
> (Salomon,1979, p. 8)

Salomon's Media, Cognition and Learning argues that study is needed o f the nature of a medium's most essential attributes and the psychological functions that they can be made to accomplish under different conditions and for different learners.

Sixth, such a review should be eclectic and pragmatic, making appropriate use of strategies grounded in behavioral, cognitive, and humanist learning and instructional theories, as opposed to being based in a narrow philosophical viewpoint. It is likely that for certain learners, given certain goals and learning tasks, one set of instructional strategies might be quite appropriate, and for a different group, entirely different strategies would make more sense. Goldstein's Structured Learning Therapy (1973) proposes

a four-stage instructional sequence of modeling, role-playing, social reinforcement, and transfer of training to help mental patients learn community living skills. Such strategies are clearly grounded in behaviorist and social learning theories, and are appropriate for a a client group with a restricted language code (Bernstein, 1964), an authoritarian upbringing, and a low sense of self-efficacy. For the motivated group of middle managers attending workshops given by adult educator Malcolm Knowles (1977), the humanistically-oriented techniques he proposes of collaborative goal-setting, planning and evaluation make sense, since he's dealing with a group of individuals who already have the cognitive strategies to engage in self-directed learning. For instructional situations in which the goal is meaningful learning or concept acquisition,, strategies such as cuing, defining, providing examples and non-examples, sequencing, providing practice for mastery and for transfer, and reinforcing, are all appropriate (Merrill and Tennyson, 1977). A good review of instructional strategies should be practical rather than ideological.

Seventh, such a review should be especially clear about the counterintuitive findings contained in recent instructional research. For example, a favorite saw of adult educators is that adults learn more if you allow them to choose the instructional method; however Clark (1980a) has reviewed a large number of studies which indicate that learners tend to select the method from which they will learn the least. Another "obvious" truth for a while was that adults who are slower learners will profit more from novel, media-oriented approaches. In fact,

the research-based finding is that slower learners need more structure and sequence, while the capable students can handle the more novel and less-structured approaches (Cronbach and Snow, 1977). Another incorrect assumption has been that if you want to predict who will learn most, it's important to know such things as sex, socioeconomic status, religion, and goals. In fact, general intelligence is the best predictor of amount of learning, and when that is controlled for, the sociodemographic factors don't account for any variance. The sociodemographic factors are useful in helping to predict who will participate, but not who will learn. Gage and Berliner (1979) provide an excellent beginning list of counter-intuitive findings with implications for appropriate use of instructional strategies.

Such a review of research on instructional strategies would be a contribution to the field of adult instruction in general, not just to the field of television-centered instruction. Comparative media studies indicate that the technology of transmission is not a significant variable in learning outcomes (Schramm, 1977; Briggs, et al, 1976). Any medium can be used to teach, and the selection of strategy should rest on our current knowledge of instructional research and development, which would be summarized in a good review of research on instructional strategies.

IV. A COMPREHENSIVE REVIEW OF RESEARCH IS NEEDED ON THE TECHNOLOGIES OF TRANSMISSION AND THE LOGISTICS OF DELIVERY. WHAT WOULD REACH WHOM, IN THE MOST COST-EFFECTIVE MANNER?

Such a review should have a number of characteristics. First, it should catalog the various technologies, give a functional description of each, characterize its critical delivery capacities and limitations, and provide an estimate of costs. Dordick et al (1979) have developed a manual entitled"ITV: A User's Guide to the Technology,"under the auspices of The Office of Engineering Research of The Corporation for Public Broadcasting which comes close. It presents an overview of available instructional television technologies, over-the-air transmission such as broadcasting, ITFS, and satellite; wire or cable transmission, such as cable television and common carrier services; and copy technologies such as videotape, videocassette and videodisk. It also explores some mixed distribution modes, including ITFS and cable television broadcasting and copy and cable and broadcasting. Additionally, it presents several multi-mode options that meet such special objectives as maximizing program availability for a minimum cost. Its main limitation is that it is written mainly to assist school administrators and teachers make effective use of instructional television, rather than including examples and issues for adult and continuing education.

Second, such a review should provide alternate models for use: large-scale and complex, medium-scale, and simple and transportable. These models would relate the critical features of information delivery to an array of user needs and capacities.

Third, it would be helpful if such a review could be illustrated with some detailed case studies. For example, the TAGER Television Network links seventeen college and university campuses in Texas to a large number of corporate subscribers in the area, who receive graduate courses in business and engineering and handle around 2,000 registrations per semester (The Association for Higher Education of North Texas, 1981). In Seattle, a consortium of eleven colleges and universities is providing credit and non-credit courses, professional contining education and developmental education to 100,000 homes and public libraries by cable (Dirr, 1981). In Ohio, a consortium is using the two-way capabilities of the Warner. Amex Qube system to provide courses (Dirr, 1981). In San Diego, the State College is using cable radio to provide credit courses which fulfill the general education requirements leading toward a Bachelor's degree (Dirr, 1981). Many community colleges are collaborating with public broadcast stations and other community agencies to serve both formal and nonformal learning needs of the community (Richardson, 1980; Yarrington, 1979). The case studies should include empirical data on cost, time, personnel, and management systems involved in the various models, and should clearly identify the economies of scale which result from the different models. The case studies should relate the technologies to such features of their setting as community size, institutional factors, and alternative uses. They should also be explicit about unintended consequences.

V. A REVIEW OF RESEARCH NEEDS TO BE DONE ON THE TECHNICAL ASSISTANCE AND TRAINING NEEDS OF THE NEW ADOPTERS.

The Corporation for Public Broadcasting's Higher Education Utilization Study (Dirr, et al, 1981) found that major factors which seem to affect positively the use of television for instruction include: faculty members' support for the use of television for instruction, availability of courses which meet the academic needs and standards of the colleges, and television outlet operators who are sympathetic to the colleges' goals for television use. Each of these areas imply a need for technical assistance and training.

Faculty members' support for the use of television for instruction can best be gotten by involving them in all aspects of decisionmaking. Evaluation of the federal programs developed during the U.S. "Great Society" years of educational reform and of federal attempts to change the school indicate that the local practitioner is a powerful and legitimate force to be reckoned with (Dollar, 1978). Research on adoption and diffusion of innovation (Havelock and Huberman, 1978) argues for the importance of the local educator or planner. The complexities of the educational setting as a social system, combined with the primacy of personal contact, argue for the necessity for local faculty members to participate in all aspects of program development or utilization. Effective implementation requires personal interaction and contacts among practitioners and between practitioners if old roles are to be changed and new ones are to be learned.

Empirically, the overall quality of any instructional development process will ultimately be judged by the quality of the instructional products and the teaching-learning system developed. Instructional products must be developed which meet the criteria for quality in three areas: content, instructional design, and aesthetic appeal. Additionally, they must meet the needs and expectations of external critics who act as gatekeepers. Richardson (1980a)found that different criteria are employed by people who hold different roles in an organization. Faculty members look for "materials which have substantial educational content and meet the standards of the college." Station managers are more interested in "materials which are of high production quality and meet the standards of the station." Instructional designers are most concerned that "materials are structured to enhance motivation, participation, persistence, and learning on the part of the at-home learner." Marketers are looking for "materials which are designed for flexible and compatible use in a variety of settings." The casual homeviewer is unlikely to watch unless "materials meet learner's needs, stimulate interest, have broad appeal, and attract large, general audiences." Clearly, achieving a"quality" instructional product is no easy task.

Similarly, certain quality criteria for the teaching-learning system must be met. Richardson (1980a) found the following to be the major expectations for a quality teaching learning system: The system must have a special plan for telecourse delivery,

including processes for academic administration, target population assessment, inservice training for counselors and course managers, curriculum development and design, and research and evaluation. Each course must be designed as a coordinated instructional system, with all components working together to serve t'e same instructional objectives. Local support services must foster involvement (personal contact by phone or mail, seminar opportunities, counseling) and feedback (self-study quizzes, prescriptive comments on homework). Administrative arrangements must be designed for the adult learner: information and recruitment materials must be easily available; simple procedures must be available for registering, taking exams, obtaining course credit. Television programs must be offered at times convenient to the adult learner. These criteria were developed through interviews with telecourse students, faculty members, station managers, community college administrators, and marketing representatives, and need further validation (Richardson, 1980a).

All of the above topics have implications for the technical assistance and training needs of the new adopters of telecourses, whether they are designing, selecting, or establishing support services for them. The new technologies can't just be added on; in some cases they require a rethinking of the total educational system in order to be viable. Understanding the training needs of each member of the system is crucial.

In sum, the new adult client group may or may not be effectively served by telecommunications delivery systems, but it will clearly take more than high hopes to accomplish it. Just after the Civil War, new railroad tracks were built all over the country, and alongside of many of them, new colleges were built too. The assumption seemed to be that once the technology was in place to deliver the people to the site of learning, everything else would fall into place. Unfortunately, many of these new institutions were unclear about their mission, unable to effectively recruit and retain students, had an inadequate grasp of the teching-learning process and the related effective instructional strategies, and weren't able to train and develop their staff quickly enough to serve their students. So many of them withered away shortly. It wasn't enough then to deliver the students to the instruction, and it isn't enough now to deliver the instruction to the student. We need to take stock before we charge ahead, and some reviews of research for decisionmakers can assist us in the stock-taking.

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